



# A new horizon for solar energy

Soltigua presents PTMx,  
the parabolic solar collector  
for a wide range of applications.





# Soltigua, a new frontier for an unlimited source

Clean energy production, greenhouse gas emissions' reduction and environment preservation: Soltigua creates new opportunities for the commercial and industrial sectors in terms of sustainability. Soltigua offers solar-based innovative solutions to respond to the modern requirements of air-conditioning and industrial heat production.

The parabolic solar troughs produced by Soltigua are the core of these energy systems; they are solar thermal collectors which track the sun and concentrate its rays, enabling the system to reach high operating temperatures (up to 280°C). Hence, solar energy can be used in areas previously considered not suitable for renewable energies.

Soltigua's solar concentrating systems can adapt to all requirements, from HVAC systems for small buildings to large solar fields for industrial use.

Due to their distinctive design, Soltigua solar troughs clearly mark the sustainable profile of a building.

## Possible applications for solar thermal collectors

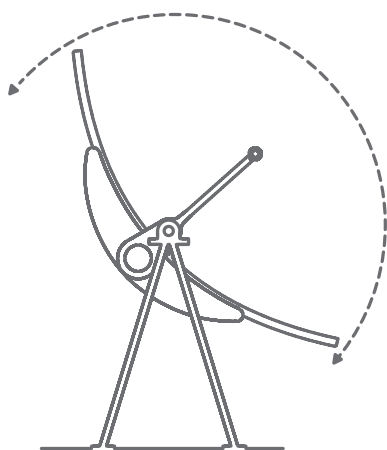




# PTMx: the parabolic trough for a wide range of applications

PTMx, Soltigua's parabolic trough, is developed and produced in Italy. Due to several innovations, PTMx includes all the advantages of solar concentration that used to be available exclusively in large solar thermal power stations.

Today, this innovative technology becomes available for a wide range of applications.



PTMx parabolic collectors include the following innovations:

- high modularity, available also in small sizes;
- multiple possibilities of installation, such as, for example, on flat roofs;
- modern and attractive design;
- unbreakable mirrors;
- precise and reliable sun tracking system;
- automatic safety devices;
- possibility of installation along any orientation,
- certification according to EN 12975.

PTMx is available in four basic models of different size, that can be combined in order to realize customized solar fields, starting from few hundred square meters of collecting surface.



**1 m<sup>2</sup> of parabolic trough can produce over 1000 kWh annually at 150°C, hence avoiding the emission of over 200 kg of CO<sub>2</sub> into the atmosphere<sup>1</sup>.**

## Technical features

Model	PTMx-18	PTMx-24	PTMx-30	PTMx-36
Net collecting surface [m <sup>2</sup> ]	41	54	68	82
Aperture width [m]	2,4			
Length [m]	20,7	27,2	33,2	39,6
Peak power <sup>1</sup> [kW <sub>p</sub> ]	23	31	39	47
Mirrors	Highly reflective tempered glass			
Receiver	Selectively coated tube			
Working temperature	Up to 280°C			
Heat transfer fluid	Water or thermal oil			
Further features	<ul style="list-style-type: none"> <li>- Completely automatic</li> <li>- Monitoring and diagnosing system</li> <li>- Night or bad weather automatic stowing procedure</li> <li>- Web based remote control</li> <li>- Safety system against overheating</li> </ul>			

## Energy yields<sup>1</sup>

[kWh/m <sup>2</sup> year]	Phoenix (USA)	Johannesburg (South Africa)	Alexandria (Egypt)	Riyadh (Saudi Arabia)
100°C	1'434	1'239	1'291	1'396
200°C	1'293	1'135	1'150	1'263



Front view of a PTMx-24 collector.

<sup>1</sup> The above-listed energy data of the parabolic troughs are purely indicative. The efficiency of the solar concentrators could vary depending on the installation's location and orientation, climatic conditions, plant design adopted and the fossil fuel which is being substituted.

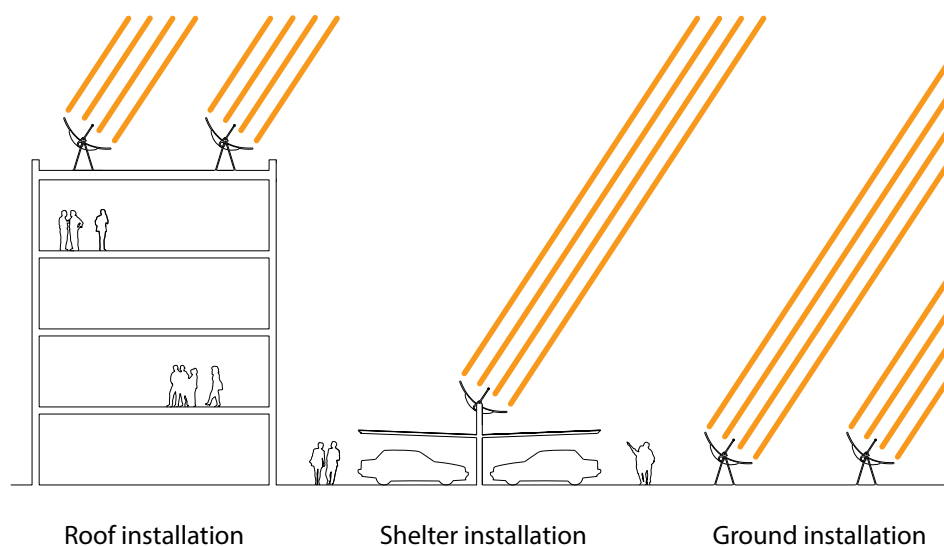




# A sustainable identity

PTMx can be used in both new and existing buildings to complement traditional energy sources. The parabolic troughs can be installed on flat roofs or on top of parking slot shelters. They can also be organised to create solar fields on ground<sup>2</sup>. Thanks to its special characteristics, PTMx functions also in rigid climates, representing an optimal solution for residential, commercial and industrial buildings.

Due to its modern design, PTMx is an architectural distinctive sign that characterises a building's profile and communicates environmental awareness. The parabolic troughs therefore increase the value of the building by emphasising its sustainability.





**The CO<sub>2</sub> emission reduction of one PTMx-24 operating at 200°C is equal to the contribution of a forest of over 300 trees<sup>3</sup>.**

**Ideal installations include:**

- industrial sites in various sectors (food and beverage, textile, industrial cleaning, etc.)
- shopping malls
- hospitals
- tourist and hotel resorts
- office buildings
- district heating and/or district cooling systems



<sup>2</sup> Verify the suitability of chosen installation with the building's characteristics and with the relevant regulation.

<sup>3</sup> Indicative data.



# Solar cooling, air-conditioning directly from the sun

Solar cooling is one of the most fascinating applications of solar energy, because it generates air-conditioning from the sun's energy. This system takes advantage of the coincidence of high summer solar radiation and the need for air-conditioning during the same period. This reduces significantly the energy consumption of the building, thus increasing its environmental sustainability.

In particular, solar cooling decreases electricity consumption during peak hours and therefore reduces the risk of blackouts due to grid overload. A source of traditional heating and a storage system enable continuous operations at night or during cloudy periods.

PTMx solar concentrators represent a revolutionary technology because they achieve a high efficiency of the cooling system by supplying a double effect absorption chiller with high temperature heat. Unique in its kind, this solution permits the maximum exploitation of the sun's potential, generating an energy efficiency which can not be reached by other solar technologies.

## Comparison of solar cooling technologies<sup>4</sup>

Average performance per sqm installed	evacuated tube collectors + single stage absorption chiller	parabolic troughs + double stage absorption chiller
Collector efficiency	0,6	0,5
Chiller efficiency (COP)	0,7	1,34
Total system performance	0,42	0,67 +60%

## A complete system

PTMx can be efficiently used to integrate domestic hot water production and to contribute to a building's heating during winter, offering a complete solution for HVAC systems that reduces emissions and the energy bill. Due to its characteristics, PTMx can also function in combination with medium-temperature-heating-systems.

Furthermore, by using clean and renewable solar energy, parabolic troughs represent the most appropriate technology for realising solar district heating and cooling systems.



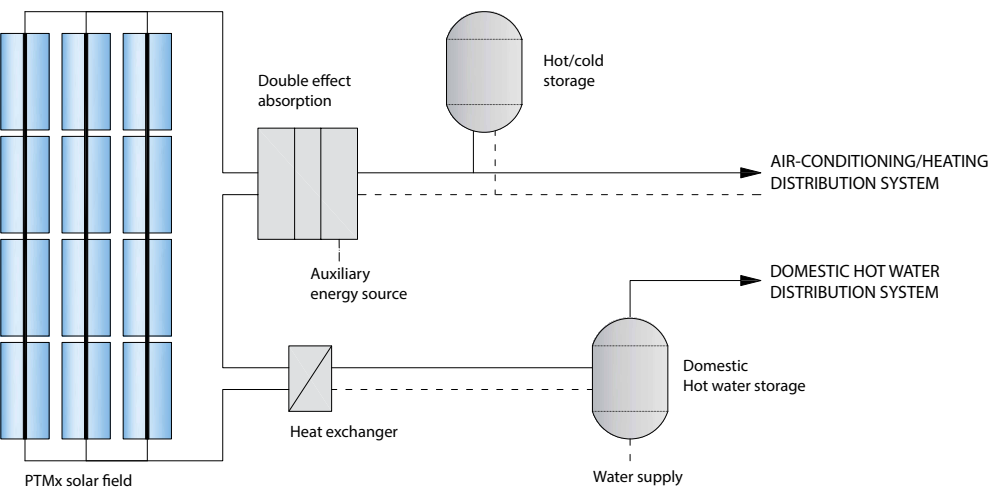


Compared to traditional solar cooling technologies, PTMx concentrators can increase the solar cooling efficiency by 50% <sup>4</sup>.

Case study<sup>5</sup>

Office Building	Phoenix (USA)	Johannesburg (South Africa)	Alexandria (Egypt)	Riyadh (Saudi Arabia)
Solar collecting surface [m²]	653			
Chiller capacity [TR]	100			
COP	1,3			
Annual solar cooling energy [MWh <sub>cond</sub> /year]	738	725	820	872
Total CO <sub>2</sub> savings [ton/year]	148	145	164	174

System layout



<sup>4</sup> The performance data published are indicative and partially based on commercial information.  
<sup>5</sup> The present case study is obtained through computer simulation and based on a hypothetical scenario regarding the location and the orientation of the installation, the climate conditions, the building, etc. It is therefore published as an indicative estimate.



# Process heat production

Thanks to the abundant solar radiation available throughout the solar belt, a vast number of industrial processes that require thermal energy can be realised by integrating traditional energy sources with solar energy. In sectors where medium temperature heat is required PTMx collectors can be used to generate process heat. Energy savings and environmental pollution reduction are particularly efficient in processes where daily and annual demands for heat are constant, or where peaks of demand are reached during summer (e.g.: dry-cleaning facilities for tourist resorts).

## Industrial processes suitable for PTMx integration

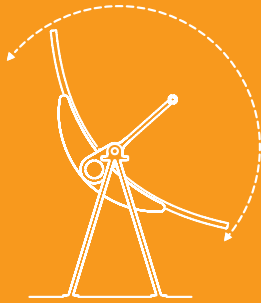
Industry	Process	Temperature [°C]
Food and beverages	cleaning	80 - 150
	pasteurisation	80 - 110
	sterilisation	130- 150
	drying	130- 240
	cooking	80 - 100
Plastic	extrusion and drying	150- 180
Chemical	heat treatments	150- 180
	boiling	95 - 100
	distillation	110- 300
	drying	150- 180
Paper	bleaching and drying	130- 180
Textile	washing	80 - 100
	heat treatment	80 - 130
	bleaching	60 - 100
	dyeing	100- 160
Industrial cleaning	steam washing	150

## Further applications

- PTMx parabolic troughs can be efficiently used to realise:
- seawater desalination plants;
  - industrial refrigeration at temperatures below 0°C;
  - localised power station plants.



The picture represents the installation of PTMx realised in Northern Italy. The system is used for solar cooling and supplies an office building with air-conditioning during the summer period whilst, during winter, it contributes to the offices' heating. It also integrates domestic hot water production throughout the entire year.



Main advantages of Soltigua's PTMx parabolic troughs:

- Maximum efficiency for solar cooling
- High energy savings
- Reduction of CO<sub>2</sub> emission
- Elimination of environmental impact
- Modern design for a sustainable architecture
- Wide range of working temperature, unreachable by traditional collectors
- Adaptable to all sizes, from mini to maxi



Soltigua concentrating collectors can supply solar energy to thermal processes up to 280°C. By manufacturing both parabolic troughs and Fresnel collectors, Soltigua can offer the most suitable solution for the specific client needs.

For further information and request for proposals please contact: [info@soltigua.com](mailto:info@soltigua.com)



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